

1 What is claimed is:

2 1. An apparatus for amplifying an output of a photodetector, comprising:  
3 a first circuit path comprising a first transistor, a current from said photodetector  
4 being supplied to the first circuit path; and

5 a second circuit path comprising a second transistor, said two transistors  
6 connected to form a current mirror arrangement, said two transistors being such that the  
7 current mirror arrangement provides a signal that is an amplified version of the output of  
8 the photodetector.

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1 2. The apparatus of claim 1, wherein said photodetector is in the first circuit  
2 path.

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1 3. The apparatus of claim 1, said two transistors comprising MOS transistors,  
2 wherein said second transistor has a width/length ratio that is larger than that of the first  
3 transistor.

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1 4. A photodetection apparatus, comprising:

2 a first photodetector;

3 a first device comprising:

4 (a) a first circuit path comprising a first transistor, a current from said first  
5 photodetector being supplied to the first circuit path; and

6 (b) a second circuit path comprising a second transistor, said two transistors  
7 connected to form a current mirror arrangement, said first and second transistors being

8 such that the current mirror arrangement provides for the first device an output signal that  
9 is an amplified version of the output of the first photodetector;

10 a second photodetector; and

11 a second device comprising:

12 (c) a third circuit path comprising a third transistor, a current from said second  
13 photodetector being supplied to the third circuit path; and

14 (d) a fourth circuit path comprising a fourth transistor, said third and fourth  
15 transistors connected to form a current mirror arrangement, said third and fourth  
16 transistors being such that the current mirror arrangement provides for the second device  
17 an output signal that is an amplified version of the output of the second photodetector.

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1 5. The apparatus of claim 4, wherein said first photodetector is in the first  
2 circuit path.

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1 6. The apparatus of claim 4, wherein said second photodetector is in the third  
2 circuit path.

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1 7. The apparatus of claim 4, said first and second transistors comprising  
2 MOS transistors, wherein said second transistor has a width/length ratio that is larger than  
3 that of the first transistor.

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1 8. The apparatus of claim 4, said third and fourth transistors comprising  
2 MOS transistors, wherein said fourth transistor has a width/length ratio that is larger than  
3 that of the third transistor.

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1           9.     The apparatus of claim 4, wherein said first and/or second photodetectors  
2     are photodiodes.

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1           10.    The apparatus of claim 4, wherein the apparatus is used in an optical  
2     encoder having a slit plate, said plates comprising a plurality of slits with a predetermined  
3     pitch, wherein relative motion is caused between the plate and the photodetectors, and  
4     wherein at least some of said photodetectors are aligned in a direction of the relative  
5     motion and spaced at an interval corresponding to  $\frac{1}{2}$  said predetermined pitch of the slits.

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1           11.    A photodetection apparatus, comprising:

2           a first photodetector;

3           a first circuit path comprising a first transistor, a current from said first  
4     photodetector being supplied to the first circuit path;

5           a second photodetector; and

6           a second circuit path comprising a second transistor, a current from said second  
7     photodetector being supplied to the second circuit path, wherein there is no feedback path  
8     in at least one of the two circuit paths.

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1           12.    The apparatus of claim 11, wherein said first photodetector is in the first  
2     circuit path.

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1           13.    The apparatus of claim 11, wherein said second photodetector is in the  
2     third circuit path.

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1           14. The apparatus of claim 11, wherein said first and/or second photodetectors  
2 are photodiodes.

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1           15. The apparatus of claim 11, wherein the apparatus is used in an optical  
2 encoder having a slit plate, said plates comprising a plurality of slits with a predetermined  
3 pitch, wherein relative motion is caused between the plate and the photodetectors, and  
4 wherein at least some of said photodetectors are aligned in a direction of the relative  
5 motion and spaced at an interval corresponding to  $\frac{1}{2}$  said predetermined pitch of the slits.